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January 20, 1951

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A SCIENCE SERVICE PUBLICATION

RADIO

Blobs Are Studied

Better television reception should result from measurement of these small air eddies. Instrument also useful in micrometeorology.

➤ BETTER television reception, with less interference from nearby stations, will result from the measurements of small air eddies, or blobs, being made in Washington. These eddies scatter short radio wavelengths, such as those used in TV or radar.

When more is known about why these blobs are there and where they come from, their properties can be used not only to prevent interference but also possibly to send television and other short wavelengths over longer distances.

Up to now, George Birnbaum, S. J. Kryder and R. R. Lawson of the National Bureau of Standards, report that they have made their blob measurements only up to roof-top height, or about to three or four stories. They plan in the near future to measure these eddies from a tower, and later probably from captive balloons or by flying the equipment.

They demonstrated the equipment they use to make these measurements to the Conference on High Frequency Measurements. The scientists study these blobs that affect television reception by measuring at the same time, the moisture, wind speed, temperature and refractive index of air.

Although the air seems to be pretty much the same throughout, actually these invisible "dielectric eddies" change the way in which the short wavelengths are transmitted through the air in a way that can be measured. Although the changes are very small, they have a most pronounced effect upon the propagation characteristics of the wavelengths.

Normal radio waves are apparently not affected by these blobs because they are much too long, about half a mile in length. Waves in the range of three and a half feet, however, are very much affected.

The scientists predict that one of the instruments they are now using to measure the blobs could be developed to give a very precise method of measuring rapid changes in the absolute humidity for micrometeorology.

Micrometeorology, the study of weather in the very immediate vicinity, is of interest to plant breeders who like to know, for instance, just how much moisture there is within an inch or two of a growing plant.

Science News Letter, January 20, 1951

MEDICINE

More Group O in South

In case of emergency requiring large amounts of blood the best source of group O donors would be in southern part of country. B also varies geographically.

➤ IN THE event of an emergency requiring large amounts of blood, such as an atom bomb attack, the southern part of the United States will be a better source of group O donors and the northern part of group B donors.

A statistical study showing this and other geographical features of blood groups in this country is reported by Drs. George W. Hervey and Louis K. Diamond and Miss Virginia Watson of the American Red Cross National Blood Program (JOURNAL, AMERICAN MEDICAL ASSOCIATION, Jan. 13).

The regional differences for groups O and B are fairly strong, but only moderate for group A and except in occasional instances the AB group does not show variation. The differences are from north to south, but none were found from east to west. For each degree of latitude proceeding from north to south, the group O percentage was greater by 0.32 on the average.

"Probably the most acceptable interpretation," the scientists state, "is that in the South the hereditary lines of the early settlers, many of whom were Scotch, Irish, and Welsh in origin, have been subjected to less admixture from the outside than in the North. In the southwestern regions the ancestry of some persons recorded as white may be partly American Indian, slightly raising the O percentages therein."

The regional differences in blood groups could be changed markedly within a very few years by population shifts, the scientists point out.

Data for the study came from 141,774 white persons who voluntarily gave blood to the American Red Cross in 15 cities and 637 outlying communities from January, 1948, through March, 1949. This is "one of the largest aggregate samples ever described for a program under standardized technical procedures."

The majority of the blood donors were in the industrial, clerical and professional classes. Men predominated numerically, ranging from 65% in Springfield, Mo., to more than 80% in Charlotte, N. C., and Detroit. No significant difference in the incidence of any blood group could be determined between men and women.

Science News Letter, January 20, 1951

PHOTOGRAMMETRY

Mapping All Possible Battlegrounds Urged

➤ MAPPING of every possible battlefield in the world is urged by Maj. Gen. Lewis A. Pick, Chief of Engineers, U. S. Army.

Maps are tools of war. Therefore, we cannot be fully prepared mapwise for emergency periods until every potential battlefield has been mapped on a large scale, Gen. Pick emphasized to the American Society of Photogrammetry meeting in Washington.

Certain peacetime mapping projects must be cut down, he said, so that we can concentrate on military mapping of "many scattered areas." This is essential to our national defense.

Despite our most concentrated efforts on mapping during and since the last war, less than five per cent of the land area of the earth is adequately mapped. He stated that it is easier and cheaper to supply adequate maps during peace than in the hurry of emergencies, and urged an adequate program for mapping during peacetime, not hindered by the inevitable waves of economy which roll up at the end of a conflict.

Science News Letter, January 20, 1951

AGRICULTURE

Hardy Weed Seeds Live Many Years

➤ MANY weed seeds are so hardy that they can lie sleeping in a farmer's field for 10 to 30 years, then sprout and flourish, Dr. F. W. Went of California Institute of Technology has found.

In general, weed seeds will remain ready for growth under field conditions for ten-year periods. Even after 20 to 30 years, Dr. Went stated, a considerable percentage of buried weed seed is still viable. Even when soil and temperature conditions are favorable, these seeds may not start growing for many years.

"Dozens of years of continuous removal are necessary to exhaust the soil from its natural complement of weed seeds," Dr. Went said. "Almost every field which has been cultivated has a weed supply sufficient for a dozen years or more."

Science News Letter, January 20, 1951

MICROSCOPY

TV Linked to Microscope

A color-sensitive television camera looking through a conventional high-powered microscope, gives scientists hope of learning new facts about living cells.

See Front Cover

➤ BY LETTING a color-sensitive television camera look through a conventional high-powered microscope, scientists now have the hope of discovering new facts about living cells.

The new RCA television-microscope combination tested at Princeton uses new television tubes that range from the infrared to the ultraviolet ends of the visible light spectrum.

Contrasts between the various chemical and structural parts of living cells are picked up more effectively by this new television technique than by either the human eye or the photographic plate. Television views can now replace the staining of killed cells as well as tedious photographing through color filters.

Discovery of unknown particles in living cells has already been made by Princeton University scientists using the new television-microscope tested by Dr. A. K. Parpart, chairman of the Princeton department of biology.

Within a few weeks the new technique will be used on cancer cells and tissues in hope of finding useful clues to the problem of malignancy.

Many components of living cells normally visible only after killing and staining can be studied by switching the television scanning from a vidicon tube sensitive to the blue end of the spectrum to one most effective in red light. This gives superior contrast.

Some parts of the cells are visible in one kind of light and invisible in other wavelengths.

The television cameras used are adaptations of those used in industrial television systems, such as used for viewing dangerous atomic installations and watching remotely controlled machinery. Their application to microscopy was done by L. E. Flory and J. M. Morgan of RCA Research Laboratories. Dr. Parpart and Mr. Flory are shown with the instrument on this week's cover.

Television microscopes will allow large audiences in classrooms and lecture halls to see what now can be viewed only by a lone researcher with his eye glued to the microscope eyepiece. Princeton physics classes have already used the new combination to see the Millikan oil drop experiment and the Brownian motion.

Science News Letter, January 20, 1951

MEDICINE

Comatose Patient Saved

Woman 73 years old with gall bladder removed was restored by artificial kidney after her own organs failed to function.

➤ AN ARTIFICIAL kidney saved the life of a 73-year-old woman with high blood pressure. The case was reported to the Surgery Study Section of the U. S. National Institutes of Health.

The patient had had her gall bladder removed. For eight days afterwards her kidneys failed to function and the patient was in a coma. When the artificial kidney took over, the patient regained consciousness, sat up and ate and retained 1300 calories of food daily, even though her own kidneys did not resume functioning for four more days.

Her case, one of 150 in which the artificial kidney is credited with saving life, was reported by Dr. John P. Merrill of the Peter Bent Brigham Hospital, Boston.

Kidney function after major operations, Dr. Merrill pointed out, frequently is impaired. The resulting urine retention or anuria may be prolonged and severe enough to endanger life. The artificial kidney does not affect the anuria or restore the kidney to normal. But it can take over some of the normal kidney jobs, saving the patient from poisoning through disturbed body chemistry until the patient's own kidneys have recovered.

Science News Letter, January 20, 1951

ENGINEERING

New Clamps Reduce Radio Interference

➤ RADIO interference from high voltage electrical transmission lines is reduced with a new suspension clamp developed by the engineering division of the Boeing Airplane Company. The device will also prevent the power line electrical losses occurring where conventional clamps are used.

LIGHT—This aluminum power line clamp is designed to reduce radio interference caused by electrical discharge from high-voltage lines.

These clamps will soon be installed on new power lines being constructed by the Bonneville Power Administration, Portland, Ore., leading from the government dam on the Columbia River at Bonneville. Boeing has just received a contract with the Bonneville authorities for $140,000 for the delivery of 18,000 of the new clamps. They will be used to hang the power conductors from standard insulator strings.

Made of aluminum, the clamps are nonmagnetic to prevent electrical losses occurring where conventional steel-type clamps are used. The lower part of the new clamp is a "skirt" to shield the vulnerable portions from the electrostatic field set up by high voltage.

Science News Letter, January 20, 1951

AGRICULTURE

Scotch Farm Research Unit To Serve World

➤ A NEW research unit devoted to agricultural problems is beginning operation on a 3,000-acre former estate near Edinburgh.

The Edinburgh Centre of Rural Economy, as the converted estate is now known, is planned to become a world-wide center for agricultural and horticultural research, with over 300 students from all parts of the world. Of these, 40 are already in residence.

Commercial production of tomatoes is the first project. Horticultural, agricultural and allied research organizations in Scotland cooperate.

Science News Letter, January 20, 1951

MEDICINE

Three-Prong Cancer Attack

Diet, hormones such as cortisone and ACTH, and more exact use of antibiotics form the three fronts on which the disease is being battled.

➤ A THREE-PRONGED attack on cancer has been launched at George Washington University Cancer Clinic in Washington. Diet, hormones such as cortisone and ACTH of anti-arthritis fame, and more exact use of antibiotics such as penicillin are the three prongs. Dr. Jeanne Bateman is in charge of this latest attack.

Through it, scientists expect to be able to push much further the use of nitrogen mustard, a poison gas, to relieve pain and to increase the destruction of the cancers. Chief limitation on use of this chemical has been its poisonous quality. Not enough can be given to get full use of its cancer-destroying power.

Nitrogen mustard has already been giving better results through a new method of using it devised a year ago by Dr. Calvin T. Clopp, director of the cancer clinic. Standard method of using the war gas chemical has been to inject it into the patient's veins. By this method it is used chiefly to treat the cancerous condition called Hodgkin's disease. But Dr. Clopp's method is to inject the chemical into arteries supplying the cancer with blood. Injected into veins, the poison gas chemical has to travel all through the blood stream to reach the cancer. Injected into the cancer's blood supply, much more of it can be gotten into the cancer and about three times as much can be given without poisoning the patient.

Nitrogen mustard acts like X-rays and atom bomb radiation to destroy cancers and also to destroy bone marrow where blood is formed. To protect against this bone marrow destroying effect, scientists at George Washington Hospital are giving cortisone. Although this new feature of the treatment has only been tried for a month, they already have evidence that it is succeeding.

Patients getting nitrogen mustard lose nitrogen, salt and potassium from their bodies in too large quantities. Special diets, with lots of protein food such as meat and eggs and with properly sized amounts of salt and potassium, are being used.

To keep up the patient's ability to fight germ infections, special study is being made of the patient's blood. The object is to determine, among other things, what each patient's ability is for forming antibodies against germs. Doses of penicillin and other antibiotics can be better planned with such knowledge.

Dr. Bateman's work will be pushed for another year under a $17,671 grant just awarded by the university's Alexander and Margaret Stewart Fund. Previously it was supported by a National Cancer Institute fellowship which terminates in February.

Science News Letter, January 20, 1951

PHOTOGRAMMETRY

Air Photos Better Than Ground Measurements

➤ PRE-INVASION aerial measurements of the Inchon beachhead were more accurate than ground measurements made after the invasion.

Amron H. Katz of the Photographic Laboratory, Wright Field, Ohio, told the American Society of Photogrammetry meeting in Washington that the differences between the aerial measurements from photographs and the post-invasion ground measurements averaged about six inches. Evidence points to the aerial measurements being more accurate, he stated.

Novel methods of interpreting were developed on the spot to make these very exact measurements of the seawall heights at the two invasion beaches at Inchon.

Science News Letter, January 20, 1951

Question Box

AGRICULTURE

How long do weed seeds remain viable? p. 34.

MEDICINE

How are cortisone and ACTH aiding the battle against cancer? p. 36.

How does blood aid against polio? p. 42.

Where are group O blood donors most numerous? p. 34.

MICROSCOPY

How can a television camera aid scientists in study of the living cell? p. 35.

MILITARY SCIENCE

What can now be dropped in a box from an airplane? p. 39.

RADIO

What is a blob? p. 34.

Photographs: Cover, RCA; p. 35, Boeing Airplane Co.; p. 37, Consolidated Vultee Aircraft Corp.; p. 39, USAF Air Materiel Command; p. 43, National Foundation for Infantile Paralysis.

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PHYSIOLOGY

War's Roar May Deafen

Jet plane factories and places where heavy metals are worked, or compressed air released, provide a menace to hearing.

➤ AS THE nation's factories roar into action on defense contracts, that very roar will bring loss of hearing to thousands of workers and potential compensation payments of millions of dollars from employers.

Jet plane factories are particularly noisy, but wherever heavy metals are worked, wherever steel clashes against steel or compressed air under high pressure is released from small apertures, there will be found the problem of industrial deafness.

Hearing research has only recently been turned to this particular problem. It was known to exist almost since the beginning of the industrial revolution, but nobody thought much about doing anything about it. Indeed "'weaver's ear" was thought to be a badge of honor, indicating long service at the trade.

Recently, under auspices of the Office of Naval Research, Dr. Douglas E. Wheeler, of the State University of Iowa Hospitals, has been doing research in installations at Mare Island and at Terminal Island in California. He points out that three things are important about factory noise: its intensity, its pitch, and its duration.

The acuteness of the problem is illustrated by one company, a subsidiary of the New York Central Railroad which makes freight cars.

In this case Dr. C. Stewart Nash of Rochester, N. Y., was approached by both the labor union and the company to try to establish a factual basis for compensation claims. In this company alone, it was estimated, claims might run up as high as a million and a half dollars. Company executives stated that if such claims had to be paid on a continuing basis, the shop would be forced to suspend operations.

At present, there is no basis for determining just how much noise, at just what pitch and for just what length of time, is dangerous to the hearing of the average person. Research now is bent on determining that standard.

Researchers also want manufacturing concerns to measure the hearing of new employees who go to work in noisy parts of their shops. With these records there would be some factual basis for determining the effects of different kinds of noise.

It is known that some persons are much more susceptible to noise than others. If this can be discovered by measurement of hearing over a period of a few weeks, the worker can be warned away from noisy jobs.

The danger threshold for the average person is thought to be somewhere between 70 to 100 decibels of noise, but the accompanying pitch and period of time necessary to do permanent damage is not yet fully determined.

Ear muffs do some good. Along with research into the noise itself, several manufacturers are working on more efficient ear plugs. Some can reduce the sound which reaches the inside of the ear by as much as 20 decibels. Thus, winter or summer, the fashionable thing for workers in jet plane factories will be earmuffs.

A symposium on the subject of industrial deafness appears in HEARING NEWS (Jan.) published by the American Hearing Society.

Science News Letter, January 20, 1951

MEDICINE

Rice Diet No Cure for High Blood Pressure

➤ THE RICE-FRUIT diet for high blood pressure is a relatively safe means of lowering the blood pressure for short periods in some patients. But it "is dangerous in some patients and is curative in none."

These are among the conclusions of Drs. Carleton B. Chapman, Thomas Gibbons and Austin Henschel of the University of Minnesota and the Veterans Administration Hospital in Minneapolis.

The total effect of the diet, they point out, is "to induce what amounts to semi-starvation." In high blood pressure patients who are not overweight, this semi-starvation regimen makes little sense so far as treatment goes, in the opinion of the Minnesota doctors.

Grown men on the diet lose weight at the rate of about 3.3 pounds per week. The weight loss is due mainly to loss of fat and extracellular body fluid, but over long periods body protein also is lost, the Minnesota group thinks.

Adding salt-free protein to the diet promptly stops the weight loss without interfering with its blood pressure-lowering feature.

The salt-depriving effect of the diet is termed "decidedly dangerous" in some high blood pressure patients, especially those with disordered kidney function. Use of the diet in such patients, the Minnesota doctors say, "can only be classified as a desperate expedient."

Their conclusions are based on study of changes of body composition of eight high blood pressure patients. Details are reported in the NEW ENGLAND JOURNAL OF MEDICINE. (Dec. 7, 1950)

Science News Letter, January 20, 1951

Beautiful Lake Tahoe in the Rockies provides a controversial question in California and Nevada relative to the use of its *water;* it is in part in each state.

TURBOLINER—This is the first air liner to be equipped with Allison turboprop engines. The turboprop is similar to the turbojet, but instead of using the gases of a gas turbine directly for propulsion, they are used to turn a shaft and propeller.

PHYSICS

"Hot Cells" for Isotopes

Three-foot concrete walls with steel doors a foot thick will wall off highly radioactive materials at the Brookhaven National Laboratory.

➤ STEEL DOORS a foot thick set in walls armored with three feet of concrete seal three new "hot cells" that imprison highly radioactive materials at the Brookhaven National Laboratory.

Part of new research facilities for using radioisotopes created in the Brookhaven atomic reactor, these spaces are never entered by the scientists who handle the apparatus by controls from outside and view what is happening through periscopes.

Five additional rooms or "caves" are provided for scientists who are working with less intense radioactivity. A shield of lead bricks and thick glass portholes within an enclosure provide enough protection.

A special tube system can whisk radioactive material from the reactor to the "hot" laboratories at 40-miles-per-hour speed, making delivery before some of the short-lived artificial elements disintegrate.

Even the air from these radioactive laboratories is routinely filtered to remove any straying "hot" particles. Liquids are discharged into tanks when discarded, where they are watched by Geiger counters until they lose their radioactivity and become safe. Waste materials that are too "hot" radioactively are buried at sea encased in concrete coffins.

For "deposit" of radioactive material awaiting use there is a "bank vault" which is a hole in the ground lined with thick lead.

Science News Letter, January 20, 1951

MEDICINE

Stop Kidney Stones

➤ "HIGHLY favorable" results with aluminum gel treatment of kidney stones in 22 patients are reported by Drs. Ephraim Shorr and Anne C. Carter of Cornell University Medical College, the Russell Sage Institute of Pathology and New York Hospital. (JOURNAL, AMERICAN MEDICAL ASSOCIATION, DEC. 30).

The treatment is for patients with the phosphate type of kidney stones. These are the most difficult to treat because after operation to remove the stones there is a tendency for more to form, and those not removed tend to increase in size.

The aluminum gel treatment stops this by causing formation of insoluble aluminum phosphate salts in the intestinal tract. As a result, there is less phosphate to be absorbed and then excreted by way of the kidneys.

Of several aluminum gels tried, basic aluminum carbonate gel, with the trade name of basaljel, proved most efficient.

The patients have been treated for two to seven years. Among the 22 patients there were 36 kidneys which had phosphate stones at the time of treatment or had had them previously. In the six kidneys from which stones had been removed by operation, no new stones formed under the aluminum gel treatment. In only three of 30 kidneys with stones at the time of treatment was there any increase in the size of the stones. This was of small magnitude and not progressive. Stones were passed completely from four kidneys and reduced in size in three.

By contrast, four patients who stopped the treatment all had stones that got so large they had to be removed by operation.

A diet moderately low in phosphorus is prescribed along with the aluminum gel treatment. Regular checks on the amount of phosphorus being excreted by the kidneys were made and the doctors emphasize that this is important.

Some patients may get well enough so that the treatment can be stopped. This is now being tried in a few, but the doctors do not know yet what the results will be.

Science News Letter, January 20, 1951

PHYSICS

The Atom Stars in Hollywood Movies

➤ THE LATEST movie sensation has no glamor, no sex appeal, but for all that it packs a terrific wallop. The newest star is the atom.

Already one film starring the atom has been produced by RKO and another is in production. They were produced according to outlines of scripts supplied by the Council on Atomic Implications at the University of Southern California.

One stars the atom in what might be called the story of its downfall—for it is about radiation, the process by which unstable atoms break down into atoms of lower weight and lower atomic number. It tells of the kinds of radioactivity—alpha, beta and gamma rays—how radioactive elements are produced, both by cyclotrons and in fission piles, and some of the uses of these breaking-down elements.

The second film casts the atom in the role of a villain—and charts the organization of the community's defense against him. Here the atom is considered as the source of energy in the enemy's atomic bombs and various measures of civil defense are shown.

The atom is a versatile actor. The Council has offered the outlines of five more scripts giving the atom a chance at the most varied roles. One has him playing the comedian. In this film he becomes part of radioactive cold cream, radioactive mosquitoes and even radioactive golf balls. The script points out that one-half the 25,000,000 golf balls produced each year are lost and suggests that a bit of a radioactive element under the skin of the balls, together with caddies equipped with Geiger counters might solve this pressing problem.

Science News Letter, January 20, 1951

ICHTHYOLOGY

Shrimp and Fish To Be Spotted in Gulf

➤ A NEW pinpoint accuracy in finding shrimp and fish in the Gulf of Mexico is the goal of a long-term scientific study begun by the U. S. Department of Interior's Fish and Wildlife Service.

If the investigations are successful, the era of shrimp boats dragging trawls across the Gulf for days at a time without a catch will come to an end.

During the past seven months five cruises have been made by the research vessel Oregon. Soon to be launched is a second, brand-new fishery biology ship, the Alaska.

Together, the two vessels will spend many years charting the fishing areas of the Gulf. They will correlate hydrographic information and the features of the Gulf's bottom with the presence of shrimp and other popular seafood.

The Oregon uses commercial fishing gear and methods. The Alaska will be a floating marine laboratory. Its biologists will study particularly the tie between plant food in the water, the so-called "plankton," and the amount of fish or shrimp present.

Scientists have already found that temperature and the amount of salt in one layer of the Gulf have an effect on shrimp. Also, the presence of other animal organisms in the water is an indication that shrimp are nearby. One of these "indicator" creatures is an arrow worm—a transparent bi-sexual little animal less than an inch in length.

The Gulf of Mexico study is similar to work done several years ago in the cod and haddock fishing areas off the northeastern coast of the United States. Today, cod and haddock fishing has become a precise art.

Science News Letter, January 20, 1951

MILITARY SCIENCE

Fighters May Drop in Boxes

Container will serve for either cargo or men and also can be used as a shelter on the ground. Can be dropped by parachute with air bags to cushion landing.

➤ FIGHTING men of the future may be dropped from airplanes, not as individual parachuters but as entire infantry squads inside "boxes" being developed at the Wright-Patterson Air Force Base. Parachutes lower the containers slowly and shock absorbers ease the jar as they hit the earth.

So far, no persons have been parachuted down in the container, but if and when such tests are made it will be the first descent of Air Force men in an enclosure. Two types are planned. One, called the universal container, will have a capacity of 6,000 pounds of men or cargo. The other has a 500-pound capacity.

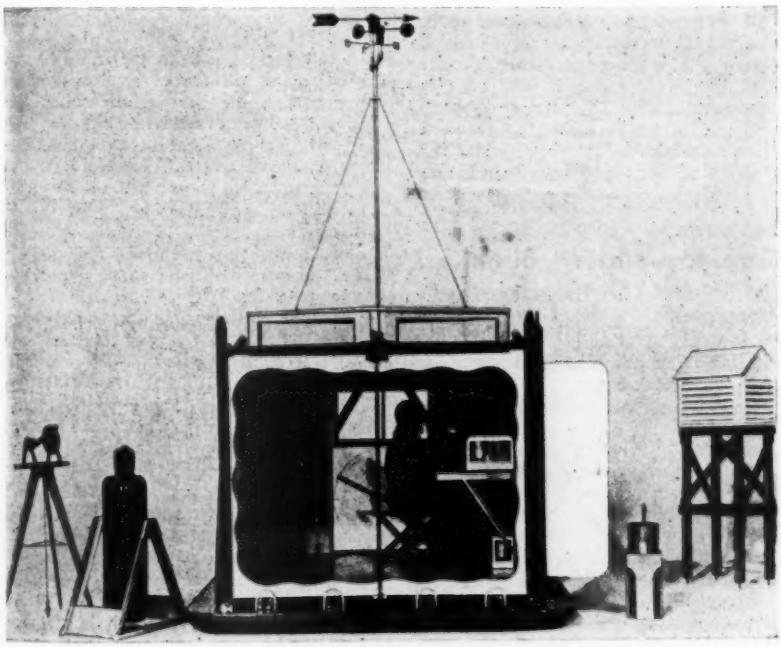
The container consists of a framework of tubular sections mounted atop a metal landing skid provided with plywood flooring. Four movable aluminum triangular compartments are attached to the framework, and can be arranged as a square box to carry cargo, or can be rearranged to carry troops.

Two types of parachutes are used for the descent. A single 100-foot parachute may be used for loads up to 3,500 pounds. Two of these are used for heavier loads. The parachute equipment is placed atop the container. A small 'chute pulls out a 16-foot extraction chute, which pulls the container out of the plane.

Landing is eased by four large air bags constructed in the shape of barrels. They are fastened under the skid and remain completely deflated until the container is dropped. One-way openings in the bags permit air to rush in during descent, inflating them to form a landing cushion.

The 500-pound container is designed for dropping equipment, not men. It uses a 24-foot parachute. A 500-pound load can be dropped safely at an aircraft speed of 175 miles per hour, tests already made indicate. Lighter loads can be dropped at higher speeds.

Science News Letter, January 20, 1951



***RESCUE HUT**—This little house (the model is cut away to show interior) can be dropped from the air to provide shelter for those lost in the frigid Arctic. It is also possible to use it as a complete weather station or rescue station or it can hold cargo or an entire infantry squad with their equipment.*

ETHNOLOGY

South American Tongues Older than in North

➤ SOME of the languages spoken in South America may be older than those once used by the natives of North America.

This judgment was put forth in the sixth and last volume of the Handbook of South American Indians, just issued by the Smithsonian Institution. Dr. J. Alden Mason points out that South America was probably settled by descendants of the first arrivals on the North American continent, by people who had been pushed southward by those arriving later.

This process probably covered a period of several thousand years, Dr. Mason believes.

He takes issue with experts who have claimed that the great number of different languages is an argument for the great antiquity of man in the New World. It is argued that milleniums would have been necessary for the wide differentiation of speech to have taken place from the common tongue brought from Asia by the ancestors of the Indians.

Dr. Mason believes that the facts are quite the opposite. He thinks it is likely that each group of Asian migrants spoke a different tongue, and that the tendency is for some languages to become extinct, making the total fewer.

Whatever the reason for its numerous languages, South America is a "tower of Babel" continent, a region of the greatest linguistic diversity in the world.

Science News Letter, January 20, 1951

METALLURGY

New Chemical Method Gives Home Manganese

➤ PRACTICAL refining of hundreds of millions of tons of manganese-containing ores in this country to give a domestic supply of this steel-alloying element is promised by a method developed by Dr. E. S. Nossen of Paterson, N. J.

In the process reported to the American Chemical Society's North Jersey section, the manganese in either oxide or carbonate form is converted to its monoxide and then dissolved in nitric acid, which is recovered and reused. The major steps in the process are simple and high pressures and temperatures and gas reactions are not involved.

Nine-tenths of the manganese needed in the ratio of 13 pounds for each ton of steel produced is imported into this country, most of it from India, Africa, Brazil and Russia.

Science News Letter, January 20, 1951

MEDICINE

ACTH Cuts Burn Cure Cost To Less than Half

➤ ACTH, pituitary gland hormone that helps arthritis patients, is showing itself a relatively cheap as well as effective treatment for severe burns. Used to treat a patient with 70% of his body burned, it kept the cost of all treatment to $1,500. Cost of conventional treatment for one patient with a 40% burn is $4,000.

These figures are cited by Dr. M. James Whitelaw of Phoenix, Ariz., in his report (JOURNAL, AMERICAN MEDICAL ASSOCIATION, Jan. 13) of the now famous case of the young rancher with gasoline burns who was one of the first burn patients to get ACTH treatment. (See *SNL*, Dec. 9, 1950)

Besides giving the comparative costs of treatment in dollars, Dr. Whitelaw gives the comparative figures for supplies and personnel as follows:

Needed to treat one man with 40% burn by conventional methods: 42 tanks of oxygen, 36 pints of plasma, 40 pints of whole blood, 104 pints of fluid, 2.7 miles of gauze, drugs such as morphine and penicillin, three nurses and two physicians.

Needed to treat one man with 70% burn by ACTH: no oxygen, 21 pints of plasma, one pint of whole blood, four pints of fluid, half a mile of gauze, one nurse and one physician.

Science News Letter, January 20, 1951

ENGINEERING

New Cotton Cutter Makes Short Lengths

➤ SMOKELESS POWDER and other explosives for war uses can be made from ordinary cotton chopped into very short lengths by a novel machine developed in the Southern Regional Research Laboratory of the U. S. Department of Agriculture in New Orleans.

The short fibers obtained from cottonseed after ginning are commonly used in making guncotton and smokeless powder. The supply of this material is not great enough to meet emergency demands. There is plenty of low-grade, short-staple cotton available as an alternate source, but it has to be cut into lengths of about one-tenth of an inch so that it can be readily nitrated to make explosives. Until this machine, there has been no satisfactory device for cutting it.

The machine is a high-speed, multiple-blade rotary cutter, equipped with a feeder of radically new design which opens up the cotton prior to cutting. Development of the machine began during World War II as insurance against an expected shortage of cotton linters.

After several models had been constructed, a machine capable of cutting 10.5 tons of cotton lint or linters per hour was perfected and installed at Memphis, Tenn., to provide an adequate supply of raw materials to a government cellulose-purification plant.

A new development is a modified form of the feeder unit. It loosens and fluffs matted tufts of baled cotton and permits more thorough cleaning. This will aid in the production of better cotton fabrics, especially from hard-to-clean, mechanically-harvested cotton. Development of cutter and feeder gives assurance of ample supply of suitable cotton to make explosives for any emergency.

Science News Letter, January 20, 1951

CHEMISTRY

Wild Rubbers Usable With New Process

➤ WILD rubber having a high resin content can be converted into a product comparable with plantation rubber by a simple method developed by chemists of the National Bureau of Standards.

There are many types of wild rubber in tropical America and Africa which are rated as low-grade because of resin content. Some are of such inferior quality that they are mixed with better grades of rubber before put to use. By use of the new process a large portion of the resins in them can be extracted, making them suitable for direct use.

Investigations which led to the new extraction process were carried out by J. W. Wood and Rachel J. Fanning of the Bureau staff. They used two Mexican wild rubbers obtained from the shrubs of Chilte and Guayule. The extraction process involves a solvent and a modified commercial solvent-tight mixer. Two S-shaped stainless steel blades rotate within the extraction chamber while the solvent is added from a glass distilling apparatus.

Science News Letter, January 20, 1951

AGRICULTURE

Tomato Mildew Blight In Worst Outbreak

➤ A MILDEW disease of tomatoes called late blight ran rampant across the eastern half of the United States in 1950.

Year-end summaries by the U. S. Plant Disease Warning Service revealed the most widespread distribution of the blight ever recorded in this country. With losses to tomato growers equalling or exceeding the destructive outbreak of 1946, the disease moved westward into Arkansas, Missouri, Iowa and Nebraska, states where it was previously unknown.

In many cases untreated fields of tomatoes were completely destroyed, the report said. Last year's warm winter, followed by a cool spring and a wet summer, provided ideal conditions for the blight. These were only partially offset by the nation-wide warning service and prompt use of chemical sprays and dusts.

Science News Letter, January 20, 1951

IN SCIENCE

PUBLIC HEALTH

Sticky Tape Captures Hayfever Pollen

➤ A STRIP of sticky tape may prove a boon to hayfever sufferers next spring and summer. It is used in an improved portable device, developed by R. L. Stenburg and Lawrence B. Hall of the U. S. Public Health Service's Communicable Disease Center, Atlanta, Ga., to collect pollen samples from the air.

The samples so collected will be used to investigate the relation between ragweed pollen in the air and hayfever. When the device is in operation, air is drawn across the adhesive side of a strip of transparent tape by suction from a fan. The tape then passes through a staining bath. The stained surface is covered with another strip of tape. The specimens so trapped are then studied under a microscope.

Science News Letter, January 20, 1951

MEDICINE

Nerve Operation Relieves Heart Pain

➤ SATISFACTORY relief of the severe, suffocating chest pain of the heart disease called angina pectoris has been achieved in 10 cases by a nerve-cutting operation, Drs. James A. Evans, James L. Poppen and James B. Tobias of the Lahey Clinic, Boston, report. (JOURNAL, AMERICAN MEDICAL ASSOCIATION, Dec. 23.)

Relief was complete in five of the 10 patients except for a remaining sense of throat constriction in three. The patients were operated on from three months to three years ago. All of the patients had high blood pressure. One also had diabetes.

One 47-year-old woman operated on nearly three years ago still has occasional pain in the throat and left arm on exertion. But she wrote the doctors: "I feel much better, do much more work, have adopted a baby and am kept very busy."

Another patient had been incapacitated for 18 months, unable to do any housework or to walk in cold weather. Almost a year and a half after the operation she reported a new pain in her throat radiating to her lower jaws but she does all her housework and goes shopping in any weather.

Poorest result was obtained in the first patient who died of coronary occlusion three years after the operation.

The operation itself is similar to those that have been used for some years to relieve severe high blood pressure, but nerve paths higher in the chest are cut.

Science News Letter, January 20, 1951

ENCE FIELDS

PHYSICS

Honored for Work on Structure of Protein

➤ SYNTHETIC protein food is an ultimate goal of the work for which the top scientific award for women, worth $500, was presented.

Dr. Gladys A. Anslow, professor of physics at Smith College, Northampton, Mass., won the high honor for her paper on the structure of protein molecules. Sigma Delta Epsilon, national women's scientific fraternity, presents the prize to a member for the best paper on original research during 1950.

An understanding of the protein molecules is essential to the synthesis of proteins. Dr. Anslow's work on the ultraviolet spectra of amino acids, the building blocks of proteins, is helping this understanding of how proteins and other complex biological substances are held together.

Preliminary results of her research, supported by the Office of Naval Research and the Research Corporation, show that the specific groups involved in the basic fabric of the various proteins may be identified by their ultraviolet spectra.

Science News Letter, January 20, 1951

AGRICULTURE

Disease Threatens Texas Grazing Land

➤ A PLANT pest is threatening thousands of acres of cattle-grazing rangelands in Texas. Scientists there are trying to beat off the attack of this parasitic pest with another parasite imported from Hawaii especially for the purpose.

Looking very much like small tufts of cotton, the plant pest, known as Rhodesgrass scale, attacks over 40 varieties of grasses, on some of which cattle feed, sapping the grasses' vitality. The weakened plants are then easily killed by grazing cattle or by drought, whereas, alone, neither would be likely to kill the healthy plant.

Counter-attack weapon is a wasp-like insect imported two years ago from Hawaii, and specially bred and released in large numbers. A parasite, it feeds on the plant pest which is also a parasite.

The plant pest spreads by hatching out tiny, mite-like forms that then crawl around the plant searching a suitable spot. When located, the pest digs in, covers its body with cottony material and begins to suck the juices from its host.

Scientists of the Department of Agriculture's Bureau of Entomology and Plant Quarantine experimental station in Weslaco, Texas, in cooperation with the Texas Experiment Station, are seeking other means besides the imported Hawaiian insect to control the plant pest. Its biology and the effect of various insecticides are being investigated.

Although the scale is not spreading too fast at present, a survey in 1950 revealed that it was found in more parts of the country than had been realized. Texas, Louisiana and Florida are the most afflicted states.

Science News Letter, January 20, 1951

MEDICINE

Navy Produces Color Atlas of Disease

➤ THE NAVY has just produced a new atlas, in color. Instead of showing bays and harbors and ocean currents, this atlas gives medical students and doctors charts to the course of various diseases through blood, bones and other tissues of the human body.

THE COLOR ATLAS OF PATHOLOGY, as it is called, took six years to produce. (*Lippincott*). It is said to be the first comprehensive publication of this kind in the world. Rear Admiral Lamont Pugh, Deputy Surgeon General of the Navy, directed preparation of the atlas, with Dr. Charles F. Geschickter, of Washington, wartime head of the Navy Medical School's pathology department, and Comdr. W. W. Ayers, present chief of the department, in direct charge of the work.

The Army Institute of Pathology and Georgetown University, Washington, and the Johns Hopkins Hospital in Baltimore contributed important material for the atlas.

Science News Letter, January 20, 1951

STATISTICS

U. S. Maternal Deaths Hit New Low Point

➤ THE CHANCES of an expectant mother in the United States surviving the birth of her baby are now better than 999 out of 1,000. (JOURNAL AMERICAN MEDICAL ASSOCIATION, Nov. 25.).

This marks the first time in history that the maternal mortality rate for a large nation has been pushed below the apparently irreducible minimum of 1 maternal death per 1,000 live births, states an editorial.

The figures, for the year 1949, have been compiled by the American Medical Association's bureau of medical economic research.

Reasons for the low death rate given by the association are: (1) an increasing percentage of births in hospitals and improvements in medical care in home births; (2) development of prenatal care; (3) health education; (4) sulfa drugs, penicillin and other antibiotics, and whole blood or blood derivatives; (5) improvement in training of physicians in obstetrics.

Science News Letter, January 20, 1951

SEISMOLOGY

Water Level Shows Far Away Earthquakes

➤ YOU CAN tell if there has been a very destructive earthquake on the other side of the earth by measuring the change in water level of a well near your house.

Although scientists are using quite sensitive instruments to record water level fluctuations, you can tell about a severe quake from the meter stick that is ordinarily used to keep track of water in a well.

Hydrologists of the U. S. Department of Interior's Geological Survey report that in one well in Texas, the water level rose and fell more than two feet from the normal level on the day of the mountain-crumbling quake in Assam last August. This is just one example of many changes in water level in wells that occurred on Aug. 15, 1950.

That nearby earthquakes cause well water levels to rise and fall has been known for some time, but such marked effects from a distant earthquake have not been noted before. The Assam quake has been ranked as one of the most destructive on record. Its magnitude was 8.6, the top rating given.

Science News Letter, January 20, 1951

PHYSICS

Robot Measures Exploding Atoms

➤ A ROBOT that measures exploding atoms is helping California Institute of Technology discover the secrets of living matter.

Day and night an ingenious automatic Geiger counter does a non-stop analysis of specimens in which their protein compounds have been tagged with radioactive carbon 14.

Dr. Geoffrey Keighley became tired of seeing many hours wasted in routine measuring of radiation with instruments that his fellow scientists had to read and record. So he constructed the automatic device that whisked one specimen after another into range of the counter. The counting device, similar to the instruments used by prospectors to find uranium, responds to each particle from the exploding carbon atoms, and then the hundreds of thousands of atomic disintegrations detected are plotted on paper tapes that can be studied later.

A hundred samples can be fed into the machine and each of them can be automatically watched for 30 minutes or any desired period.

The robot Geiger counter can be used on any problem but it is now aiding the study of the synthesis of protein, important substance in human and other living bodies. Twenty-four complex chemical compounds, called amino acids, are used by nature to make proteins of various sorts. By knowing how living systems manufacture protein, scientists hope to come closer to understanding the chemical basis of life.

Science News Letter, January 20, 1951

MEDICINE

Polio Research Brings Hope

You may have had disease and never knew it. Blood and drugs give hope of immunity. And when paralysis comes, new treatments help.

By JANE STAFFORD

➤ ALL OVER the land today and for the rest of this month, dimes are being given to fight polio. Many a dime is dropped into the collection bottle by someone inwardly shuddering with fear of the disease. Many are dropped with a prayer that beloved children will be spared from an attack.

Sometimes crippling and occasionally killing, poliomyelitis, also called infantile paralysis, is perhaps the most terrifying of any disease to parents and children alike. Yet the accomplishments of the past dozen years renew hope that research such as the March of Dimes supports will some day free mankind from this particular disease horror.

Here are reassuring facts: Fully half of those who get an acute attack recover completely without any trace of muscle weakness, much less crippling or deformity. The other half will have some muscle weakness and mild to severe paralysis. With proper treatment some half of these (a quarter of the total who get an acute attack) can be so helped that the muscle weakness or paralysis is too slight to handicap them.

Polio does kill. The number varies from epidemic to epidemic. Newer methods of treatment, however, are steadily improving the chances of survival for the victims.

Bad Polio Year

Last year was a bad polio year, second worst on record. By the middle of December 33,000 cases had been reported at U. S. Public Health Service headquarters in Washington.

But in the same first 50 weeks of 1950, about 10 times as many children were stricken by measles, and half again as many had scarlet fever. More than three times as many had whooping cough. These childhood diseases are all dangerous, and all take their toll in deaths each year.

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Here's another reassuring fact about polio:

A large proportion of the population, including children, may have been attacked by polio virus without ever knowing it. They may have had an attack so mild that they passed it off as a cold or an upset stomach. Or they may have gotten the virus of the disease into their bodies without having any symptoms of sickness. After such infection the blood for a time contains antibodies to the polio virus. The antibodies, if they are like those in other diseases, make a person immune, or resistant, to further attacks so long as they are in the blood in sufficiently high concentration.

Blood containing these antibodies can be transferred, along with the potential polio-protecting property, to another person. This is called passive immunity. It is not so lasting as the kind acquired by getting the infection itself.

Whole Blood Used

As long ago as the early 1930's scientists tried using whole blood from adults to protect children against polio. More recently, blood serum from patients just recovered from an acute attack of polio has been tried as a polio-protecting measure. In these trials, however, there were no "controls." No group of children equally exposed to polio was purposely deprived of the blood or serum. Consequently, scientists do not know whether the children who got the blood or serum were really protected or whether they would have escaped polio anyway.

The polio-protecting antibodies are in the globulin part of the blood plasma. Recently scientists have developed ways of separating this globulin part from the rest of the blood, and some of it is being used to give protection from measles. On the basis of animal experiments, as well as theory, it could be used to give children short-time, passive immunity against polio. But before it is used in this way extensive trials should be made with careful controls, leading authorities think.

This kind of immunization is not the same as vaccination. The immunization with gamma globulin from blood would make use of polio antibodies formed in another person's body. Vaccination would make use of polio virus itself to stimulate antibody production by the blood of the vaccinated person, just as an attack of polio does.

Vaccination against polio was tried in the early 1930's. One vaccine was made from killed polio virus, another from living but weakened virus. Neither vaccine proved effective, and one was reported responsible for several deaths. Many polio authorities now are pessimistic about the possibilities of ever stopping polio by a vaccine, though others are still hopeful.

As everyone knows, polio does not attack all children in a community even during a severe epidemic. Some, in fact most, escape being sick though probably many get a small dose of the virus. Why some get sick and others do not is still something of a mystery. Presumably the ones who escape have developed polio-fighting antibodies previously. Some may have gotten protection from their mother's milk. Within the past year an anti-polio substance has been discovered in human breast milk. This may be the reason why in regions where babies are nursed until they are two years old or so the infants and small children escape polio even during severe epidemics. The significance and practical application of this discovery await further scientific study.

A real headache for scientists fighting polio comes from the disturbing report of a link between susceptibility to infantile paralysis and the "shots" given to protect children against diphtheria and whooping cough. These two diseases are greater killers than polio, and they will attack far more children than polio if the "shots" are not given. Yet in Australia and in England scientists found that babies routinely given these immunizing shots contracted infantile paralysis more often than children who had not gotten the anti-diphtheria and anti-whooping cough "shots."

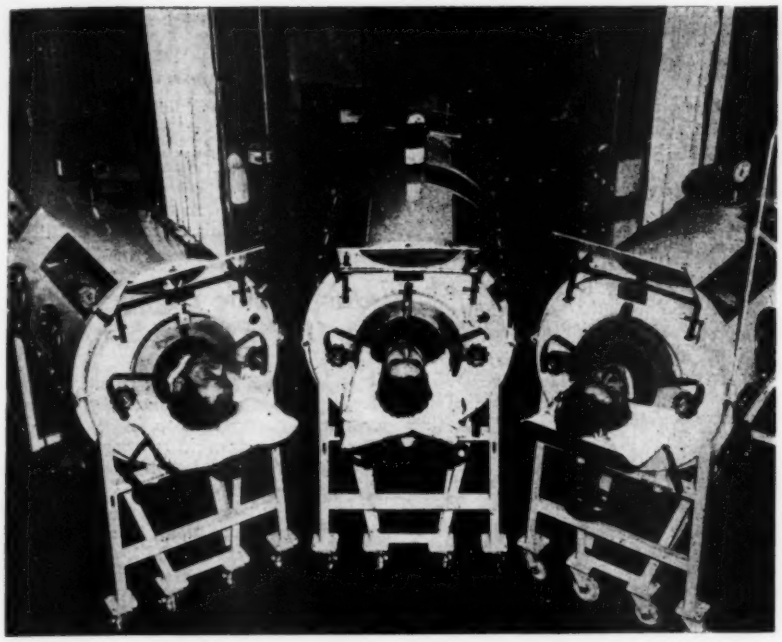
But there is a silver lining to this cloud. The shots to protect babies against diphtheria and whooping cough can be given at a season when there is little or no polio around.

Polio apparently does not spread through food, water, flies, mosquitoes or other insects. Any of these may have the virus on them, but scientists are pretty well convinced that polio spreads through the intimate contact of close, daily living. In that, it is something like the common cold.

No Escape Known

Since there is no known practical way of surely escaping polio, the universal hope is for a drug to cure it. So far, that is an unfulfilled hope. The antibiotics, so-called mold drugs, have not proved effective against polio, wonderful as they are in curing many other diseases. Some of the antibiotics, however, are effective against some viruses. There is therefore good reason to hope that one which is effective against the polio virus can be found.

Good treatment given early helps thousands of polio victims to recover with little or no paralysis. That is why parents and children should heed the warning signs of polio: sore throat, a "head cold," nausea and sometimes vomiting, fever, diarrhea or



RELIEF—"Iron lungs" rescue polio patients until their own breathing can resume the job. This cheerful trio lives at the Respirator Center at Children's Hospital, Baltimore, established there in cooperation with the National Foundation for Infantile Paralysis.

sometimes constipation, poor appetite, pain particularly in arm and leg muscles. Trembling of the hands and other parts of the body and stiffness of neck and back are other symptoms.

If paralysis or crippling does occur, there are operations that help reduce the disability. Strong muscles can be transplanted to take over the job of weakened ones. Legs can be slowed in their growth or shortened by surgery to match the polio-shortened one when necessary. Exercises, sometimes in pools such as the famous one at Warm Springs, Ga., and in others close to the polio victim's home, help strengthen weakened muscles.

Respirators, or "iron lungs," are better and more numerous than they used to be. For those who cannot live outside a respirator, there are now special centers being developed where the iron lungers can be together, stimulate each other to try longer periods outside the respirator, and get all the expert attention needed from doctors and nurses.

The polio virus has an affinity for nerves. It paralyzes by destroying nerves. Muscles unable to contract and relax because their nerve controls are dead gradually wither and shrink. Recently, scientists have been able to get the polio viruses (there are several strains of polio virus) to grow outside the body in non-nervous tissue. This is expected to help in further studies of the virus and to speed tests of possible anti-polio drugs.

The past two years have been the worst polio years on record in this country. Thousands are still fighting their way back to health and useful activity. But they are getting more and better help than could be given two decades ago, or even 10 or five years ago. Polio may strike again and again in the next few years, but its victims can be sure of getting the best care that the ever-growing science of polio fighting can develop, thanks in large part to those dimes being given all over the nation this month.

Science News Letter, January 20, 1951

AGRICULTURE

Weed Control Method Uses Oil at Night

➤ A NEW way of weed control may develop because a California plant scientist has utilized the scientific fact that the air openings in leaves of crops are closed at night.

Weeds in a field of beans were killed without hurting the bean plants when sprayed at night with a light petroleum oil, in an experiment at the Shell Agricultural Laboratory experimental farm near Modesto, Calif.

Dr. Johannes van Overbeek, Shell plant physiologist, explains that after the sun sets, the leaves of the crop plants close their stomata, which are the openings in their leaves through which oxygen enters and carbon dioxide is expelled in the "breathing" of the plant. The openings are not entered by water due to surface tension, even when they are open. But kerosene and other petroleum liquids can enter the stomata when they open, damaging the membranes of the plant cells so that the cell contents leak out. When the openings are closed, the oil spray cannot get in.

Grass is a principal weed of cultivated fields. The structure of grass is such that the delicate growing point is easily reached by oil creeping down between the rolled-up leaves of the young plant. Thus, oil at any time, in darkness or light, will enter and damage this tissue, and the night spraying will kill the grass.

A volatile oil is used in the spraying so that it has evaporated by the time daylight comes and the leaves of the beans or other crop plant get open for their daily business of growing.

The new spray is still merely experimental. Two difficulties stand in the way of a practical application: night work is involved, and the oil used is inflammable and constitutes a hazard.

Science News Letter, January 20, 1951

Missouri is the leading state in producing *walnut* timber.

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MEDICINE

New Step in Flu Fight

Family of chemicals found which have the ability to lower slightly power of influenza virus to infect chick embryos. Related compounds might be more effective.

➤ A FRESH clue to possible influenza-stopping chemicals has been discovered by Dr. Robert Hanan of the U. S. National Institutes of Health.

Compounds derived from vitamin E, or alpha-tocopherol, are capable of lowering slightly the ability of influenza virus to infect chick embryos, he has found.

The 'flu-stopping ability of the chemicals he tried is too slight to make them of value for practical application as influenza remedies or preventives. But any number of similar tocopherol compounds can be prepared. One of them might prove more valuable in anti-influenza properties.

Starting point for Dr. Hanan's research was the finding by other scientists that tocopherol compounds can check the activity of an enzyme called hyaluronidase. This enzyme acts to change another chemical, hyaluronic acid, by a process called depolymerization. This acid has certain chemical similarities to ovomucin, or egg mucin, on which the influenza virus enzyme acts. Tocopherols which inhibit the hyaluronidase enzyme might, Dr. Hanan suspected, also act on the 'flu virus enzyme.

Experiments with 'flu virus in the test tube showed this to be the case. Details of these experiments and of those showing the tocopherols can slightly check infecting activity of the virus for chick embryos are reported in the PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

Science News Letter, January 20, 1951

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AERONAUTICS

New Amphibian Plane Can Use Varied Terrain

➤ A FEEDER airplane, an eight-passenger craft developed in England, is now under flight and landing tests in South America, using either land or water for a port. It is an amphibian, dubbed the Short Sealand, and is being tested for service under tropical conditions and for use on inland waters and rough grass fields.

For landing on earth, the plane has ordinary landing gear with wheels that can be retracted into the hull. For landing on water it has wing-tip floats. The tail wheel used in dry landings folds up to become a rudder when the Sealand is taxiing on water. It can be easily taxied along narrow water channels.

The special feature of this plane is ability to operate from varied types of terrain. In addition to its ability to land on water or paved runways, it can land on grass fields whether the grass has dried up or is green and six inches tall. It is fitted with feathering and reversing propellers which shorten its landing run. A run of 800 yards is sufficient for take-off; for landing, a shorter run can be used.

Science News Letter, January 20, 1951

Some 38 chemicals produced by molds, bacteria and fungi have been discovered which are active against the tuberculosis germ; *streptomycin* is the only one now widely used.

● RADIO

Saturday, January 27, 1951, 3:15-3:30 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. E. U. Condon, director, National Bureau of Standards, will discuss "Fifty Years of Research."

ENGINEERING

Gas Turbine Engine For Use in British Ship

➤ A MARINE gas turbine engine, the first for installation in a commercially operating merchant ship, will soon be tested at the Rugby, England, works of British Thomson-Houston. It is for use in the tanker Auris.

Details of the engine are not revealed. Many gas turbines are in use in America in stationary installations. The U. S. Navy is conducting experiments with a marine gas turbine but as yet this type of power is not used on shipboard. Four gas-turbine electric locomotives are now in experimental use on railroads of the world, and several installations of gas-turbines, commonly called the turbo-prop system, are in use in both American and British airplanes.

The gas turbine is an efficient engine in which high-pressure gas resulting from combustion is forced against blades or vanes on a shaft to cause the shaft to rotate. It might be called the successor of the steam-turbine which utilizes high-pressure steam to rotate the shaft.

The customary fuel used in the gas turbine is oil but it can be operated with natural gas as fuel. A coal-burning gas turbine is under development. It uses for fuel a very finely divided type of coal, blown into the combustion chamber with air. One particular advantage of the gas turbine, besides its thermal efficiency, is its suitability for use where water is scarce. No water is required for its operation.

Science News Letter, January 20, 1951

YOSEMITE FIELD SCHOOL

A Workshop in Interpretive Methods

Twenty selected college graduates will have the opportunity to spend the summer in Yosemite National Park under the tutelage of the National Park Service Naturalist Division. They will receive intensive, varied training in the presentation of natural and human history to the public, and in the techniques of interpretation-on nature walks, with children, at campfires.

Also considered will be related matter such as museum methods and the use of museum and library materials. Twelve days will be spent in the High Sierra, an opportunity for maturing, exhilarating personal experience.

Students pay own expenses, plus modest incidental fee. Application deadline, February 28. For prospectus, address:

Director, Yosemite Field School
Box 545
Yosemite National Park, California

ENGINEERING

Giant Dams in India

▶ IN THE MIDST of the world's highest mountains on the roof of India, a river's course will be changed.

To control disastrous floods, two massive dams are being built for power and irrigation.

Along the Brahmaputra, India's 1,800-mile sacred river, soil experts are tackling the problem of serious erosion made worse by floods last year. And in Kashmir, where India touches Russia, Tibet and Afghanistan, the provincial government has embarked upon a plan to divert the Jhelum River near the capital city of Srinagar for 25 miles, turning it into a straighter bed.

The twin-dam project of Bhakra and Nangal in the Punjab would make even Kipling blink. At a cost of more than $266,000,000, these massive dams in the shadow of the Himalayan Shiwalik mountain range will irrigate a new farming area larger than the state of Connecticut, as well as provide 4,000,000 kilowatts of electrical power for new Indian industries.

The Bhakra dam will be 680 feet high, second only to Hoover Dam on the Colorado River (726 feet). Three tunnels are being blasted through the sides of a mountain gorge to control the Sutlej River. Water will fall 100 feet to power giant, bomb-proof turbines.

The irrigation network connected with the dams will involve 2,600 miles of digging before completion by 1956 or 1957. From it, the Indian government expects 1,300,000 more tons of vitally-needed food each year, and millions of bales of cotton.

Science News Letter, January 20, 1951

MEDICINE

Radiation Protection

▶ PROTECTION against usually fatal doses of radiation has been given two-thirds of a group of dogs by a special cross-transfusion of blood in experiments by Drs. Peter F. Salisbury, Paul E. Rekers, Joseph H. Miller and Norman F. Marti of Cedars of Lebanon Hospital Institute for Medical Research in Los Angeles.

The cross-transfusion was given within four hours after the dose of X-rays. Of 19 dogs not given the cross-transfusion, 16, or 84%, succumbed within eight to 25 days. But only two of six cross-transfused dogs, or 33%, died eight days after irradiation.

The four transfused dogs ate well, were moderately active, had no diarrhea or evidence of septic poisoning or hemorrhage. This was in marked contrast to the non-transfused animals. These and the two transfused ones that died showed marked depression of blood formation, widespread hemorrhages and often signs of sepsis.

The cross-transfusion was done by double-bored rubber tubes inserted into a vein of a donor dog and the recipient dog. The blood flowed from one to the other simultaneously and continuously for two hours. The dogs were given novocaine to prevent any pain. Details are reported in SCIENCE (Jan. 5).

Science News Letter, January 20, 1951

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PALEONTOLOGY

NATURE RAMBLINGS

Giants of Yesteryear

➤ WHEN we think about dinosaurs, most of us picture a monster rearing up taller than the treetops, opening a mouth like a cellar door armed with teeth like railroad spikes. Bring that monster down out of the trees until he is able to walk under the branches, and the picture will not be far wrong.

Diplodocus, biggest of the dinosaurs, was the biggest land animal that ever lived. Only some of the modern whales cheat him of the title of biggest of all earth's inhabitants.

An average diplodocus stood 12 feet high at the hips, and from the tip of his nose to the remote end of his tail he measured more than 80 feet. That is, he was five or six times as long as the family sedan. With the parking problem what it is today, it is more than well that he isn't around today. Even in dummy form, dinosaurs have totally disrupted traffic when museums have moved them from one place to another through city streets.

Diplodocus was a tame creature as prehistoric brutes went. He was the prototype of a whole group of plant-eating creatures of the same general size and shape. These were enormously heavy-bodied animals, probably unable to rise on their hind legs at least more than momentarily. They ate immense quantities of the rank vegetation which grew in their marshy homes. They were stagnantly sluggish and unbelievably stupid.

Their relatively tiny heads held brains that were mere knobs on the end of their spinal cords. For control of their leg and tail muscles and regulation of their vast digestive organs, they had what is termed a "second brain" in the spine at the junction of the hip girdle. This was an enlargement in the spinal cord making a mass of nervous tissue actually larger than the brains in the head.

Just what proportion of all dinosaurs were flesh-eaters is hard to say. There must have been many carnivores, however. The most typical were fashioned on the general lines of the tyrannosaur, and were much more highly developed critters than the vegetarians.

Tyrannosaurs had the biped habit of walking on their hind legs fairly well developed. Their short, claw-armed front legs were probably used for holding their prey while their wide, powerful jaws, bristling with sharp teeth, sought for throat or spinal column.

One of these flesh-eating saurians had a short, blunt horn perched, rhinoceros-fashion, on his nose. It was probably not much more than an ornament, for a weapon such as this would be puny alongside the great battery of teeth. But it served to distinguish him from his fellows, and gave him the name Ceratosaurus, which means "horned saurian."

Science News Letter, January 20, 1951

GEM Testing

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MEDICINE

New Drug from Soil Gives Dramatic Results

➤ NEOMYCIN, new drug from the soil, is proving "dramatically effective" in wiping out disease germs from the human body. This was shown in treatment of 10 patients with infections, chiefly of the urinary tract, which had resisted treatment with penicillin, aureomycin, chloramphenicol and streptomycin.

The results in these cases are reported by a four-man team of medical scientists (JOURNAL, AMERICAN MEDICAL ASSOCIATION, Jan. 13). They are Drs. Garfield G. Duncan, Carl F. Clancy, John R. Wolgamot and Barkley Beidleman of Philadelphia.

Neomycin is thus living up to the hopes of its discoverers, Drs. Selman A. Waksman and Hubert A. Lechevalier of Rutgers University who discovered it a year ago in a search for a drug that would stop germs resistant to streptomycin and other antibiotics.

Dr. Duncan and associates consider it significant that in no case in which germs were eradicated by neomycin did they return after the drug was stopped. Some kinds of germs, however, showed signs suggesting they might develop resistance to neomycin.

Only one of the 10 patients showed signs of any poisoning from the drug. These consisted of impaired hearing and a change in blood chemistry. The hearing improved when the drug was stopped but the blood change remained.

Science News Letter, January 20, 1951

CLIMATOLOGY

Sun Is Making Earth's Climate Warmer

➤ THE SUN'S heat reaching earth is greater than it was two decades ago and the Smithsonian Institution says that while the increase is only a quarter of one percent:

"In light of the enormous amount of solar radiation falling on the earth, it means enough extra heat to have affected the climate to an observable degree."

Dr. Alexander Wetmore, Smithsonian secretary, reported solar-constant values to the Smithsonian Board of Regents. Measurements were made on the summit of Mt. Montezuma, Chile.

Other evidence has accumulated of climatic changes in various localities over the earth, the report points out. On the whole, these changes indicate that average temperatures have increased somewhat over the past century, with an accelerated increase in recent years.

Science News Letter, January 20, 1951

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THE ADVANCEMENT OF SCIENCE—British Association for the Advancement of Science, 96 p., illus., paper, 6 shillings. Mostly addresses presented at the Birmingham meeting, 1950.

AERODYNAMICS OF SUPERSONIC FLIGHT: An Introduction—Alan Pope—*Pitman*, 184 p., illus., $4.00. A college text for an elementary course in supersonics.

AMERICAN LIGNITES: Geological Occurrence, Petrographic Composition, and Extractable Waxes—W. A. Selvig and others—*Gov't. Printing Office*, U. S. Bureau of Mines Bull. 482, 63 p., illus., paper, 35 cents. Results of an investigation to determine yields and properties of waxes from domestic lignite.

APPLIED NUCLEAR PHYSICS—Ernest C. Pollard and William L. Davidson—*Wiley*, 2nd ed., 352 p., illus., $5.00. Brought up-to-date. For those applying the techniques of nuclear physics to research problems.

AUTOMOTIVE TRANSPORTATION IN INDUSTRY—Samuel J. Lee—*Fleet Management Corporation*, 178 p., illus., $5.00. The economics of providing automobiles for business use.

FIGHTING WITH PROPERTY: A Study of Kwakiutl Potlatching and Warfare 1792-1930—Helen Codere—*J. J. Augustin*, 136 p., illus., $3.00. A study of the cultural history of this Vancouver Island Indian from 1792 to about 1930. Monograph XVIII of the American Ethnological Society.

FISH AND FISHING—E. Laurence Palmer—*New York State College of Agriculture*, 32 p., illus., paper, ten cents. Information on some of the fish found in New York State, especially fresh water ones, and how to catch them.

GEOPHYSICAL STUDIES IN THE ANTARCTIC—Thomas C. Poulter—*Stanford Research Institute*, 180 p., illus., $4.00. Scientific studies on the Second Byrd Antarctic Expedition, 1933-35.

GOING TO BLAZES—Robert V. Masters—*Sterling*, 143 p., illus., $3.50. The story in words and pictures of fires in the United States.

THE HEAVENS ABOVE: A Rationale of Astronomy—J. B. Sidgwick—*Oxford University Press*, 333 p., illus., $4.00 A systematic demonstration of astronomical facts beginning with naked eye observations and proceeding to data gained through instruments by a member of the British Astronomical Association. The American edition was prepared by Warren K. Green.

A HISTORY OF MEDICINE, Vol. I: Primitive and Archaic Medicine—Henry E. Sigerist—*Oxford University Press*, 564 p., illus., $8.50. This, the first of eight volumes, deals primarily with medicine in the great civilizations of the ancient Orient and of Egypt and Mesopotamia.

HOW-TO-DO-IT BOOKS: A Selected Guide—Robert E. Kingery—*Bowker*, 293, p., $3.50. A bibliography of books, pamphlets, government documents and other printed materials relating to the recreational and home making activities of men and women.

JESUIT SEISMOLOGICAL ASSOCIATION 1925-1950: Twenty-Fifth Anniversary Commemorative Volume—James Bernard Macelwane, Ed.—*Jesuit Seismological Association*, 347 p., illus., paper, $2.00. A history of Jesuit seismological investigations in the United States and Canada from 1900 to 1950.

LAND UTILIZATION IN AUSTRALIA—S. M. Wadham and G. L. Wood—*Melbourne University Press;* New York: *Cambridge University Press*, 2nd ed., 376 p., illus., $5.00. The authors who are professors at the University of Melbourne, discuss possible changes in land use in their country.

MONOPOLY AND FREE ENTERPRISE—George W. Stocking and Myron W. Watkins—*Twentieth Century Fund*, 596 p, $4.00. Describes the present structure of the American economy with emphasis on the relation of concentrations of economic power to the theory and practice of free enterprise. Includes the report and recommendations of the Committee on Cartels and Monopoly of the Twentieth Century Fund.

NOTES ON THE CRANIAL MUSCULATURE IN TWO SUBGENERA OF *Reithrodontomys* (HARVEST MICE)—George C. Rinker and Emmet T. Hooper—*University of Michigan Press*, 11 p., illus., paper, 20 cents. The two subgenera used for this study were *Reithrodontomys* and *Aporodon*.

THE PACIFIC ISLAND PEOPLES IN THE POSTWAR WORLD—Felix M. Keesing—*Oregon State System of Higher Education*, 48 p., illus., paper, 75 cents. Political, economic and social matters are interpreted against the racial history and cultural characteristics of the people concerned.

PETROGLYPHS OF CENTRAL WASHINGTON—H. Thomas Cain—*University of Washington Press*, 57 p., illus., paper, $1.00. Data on their occurrence and distribution.

PHYSICAL CHEMISTRY: EXPERIMENTAL AND THEORETICAL—G. Van Praagh—*Cambridge University Press*, 295 p., illus., $2.75. An introductory textbook providing many laboratory experiments. Prepared by the Head of the Science Department of Christ's Hospital, Horsham, England.

THE POINT FOUR PROGRAM: A Progress Report —Office of Public Affairs—*Dept. of State*, 10 p., paper, free upon request to publisher, Washington 25, D. C. Presents information in summary form on developments in the President's program for world economic progress through cooperative technical assistance.

PROCESS HEAT TRANSFER—Donald Q. Kern—*McGraw-Hill*, 871 p., illus., $8.00. An advanced college text telling how to solve problems of thermal design arising in the process industries.

THE PRODIGAL CENTURY—Henry Pratt Fairchild—*Philosophical Library*, 258 p., $3.75. An analysis of the great advances including those in science and technology made during the Nineteenth Century.

SERICEA AND OTHER PERENNIAL LESPEDEZAS FOR FORAGE AND SOIL CONSERVATION—A. J. Pieters and others—*Gov't. Printing Office*, U. S. Dept. of Ag. Circular No. 863, 48 p., illus., paper, 20 cents. Experiments for soil improvement using these plants known as bush-clovers in North America.

VERSUS: REFLECTIONS OF A SOCIOLOGIST—Henry Pratt Fairchild—*Philosophical Library*, 203 p., $3.75. Essays such as Population Versus Peace, Liberty Versus Security and Hunger Versus Love. Introduction by Dr. Donald Young.

WHERE TO FIND BIRDS IN MINNESOTA—Kenneth D. Morrison and Josephine Daneman Herz, Compilers—*Webb*, 122 p., illus., paper, $1.50. A guide to 62 birding areas, parks and sanctuaries.

YOUR BODY: How to Keep It Healthy—John Tebbel—*Harper*, 233 p., $2.95. Information on healthy living for the layman. Introduction by Dr. Morris Fishbein.

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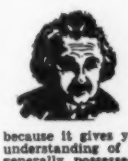

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❁ *PORTABLE photo-copier, business letter size and two inches thick, can be used wherever electric current is available. Photographic paper is placed over the sheet to be copied, the device pressed down over it and the current turned on. After proper exposure the photographic paper is removed and developed.*

Science News Letter, January 20, 1951

❁ *AIR improver, particularly for use in a poorly ventilated lavatory, is a wall attachment with a small, quiet, electric motor blower which circulates the air through activated carbon. The device does not change the air in any way except to filter out impurities.*

Science News Letter, January 20, 1951

Do You Know?

Pork is an excellent source of high-quality protein.

New York City is becoming the *fur* capital of the world.

Three days without *water* is almost certain to be fatal to a mink.

High cooking heat changes the flavor of *honey* by caramelizing its sugar.

The *marten* is one of America's rarest and most valuable fur-bearing animals.

The total requirement of *vitamin A* for the average person is contained in the average serving of sweet potato.

When indoor *poinsettias* go dormant they may be kept in the cellar until spring and then set out in a partially shaded spot on the lawn.

Before World War I, American farmers relied on Germany for potash for *fertilizers;* today the United States is producing enough for its own needs and for Canada as well.

Polished *rice* coated with thiamine, niacin and iron, fed experimentally in the Philippines to men and women, has resulted in a decrease of beriberi, a common disease in that country.

❁ *COIN and key holder, shown in the picture, is for automobile drivers and holds two nickels and one penny in readiness for the parking meter. A clock face on one side, with adjustable hands, serves as a reminder of parking time expiration.*

Science News Letter, January 20, 1951

❁ *GEIGER-COUNTER equipment, for measuring the thickness of tin coating on iron or steel, checks one side of a sheet at a time or both sides simultaneously. In this electronic apparatus, radiation from a high-intensity X-ray tube is directed onto the plated sheet and emerging radiation is measured.*

Science News Letter, January 20, 1951

❁ *ROTARY TOOTHBRUSH, electrically driven, is a recently patented device with a motor preferably of the reversible type for effective use on upper and lower teeth on both sides of the mouth. In operation it discharges tooth powder or paste from a contained magazine as needed.*

Science News Letter, January 20, 1951

❁ *GLIDE-STOP DEVICE, for high-speed passenger elevators in buildings, permits the car to travel at high speed until within 20 inches of a floor, then to come to a smooth gradual stop. Vertical magnets on the top of the car provide automatic controls.*

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